Chesapeake Bay Program's (CBP)
Scientific and Technical Advisory Committee (STAC)
Quarterly Meeting – September 13-14, 2022
Hybrid Meeting: Vandiver Inn; Havre de Grace, MD
Meeting Webpage

Tuesday, September 13th

Attendance: **W** = Webinar

Andy Miller (UMBC), Bill Dennison (UMCES)**,** Brandon Jones (NSF– **W**), Celso Ferreira (FFAR– **W**), Chris Brosch (DDA), Dave Martin (Nature Conservancy), Deidre Gibson (Hampton–**W**), Denice Wardrop (CRC– **W**), Ellen Gilinsky (Gilinsky LLC. – **W**), Ellen Kohl (St. Mary's College of Maryland – **W**), Efeturi Oghenekaro (DOEE – **W**), Eric Smith (VT – **W**), Erin Letavic (Herbert, Rowland & Grubic, Inc.), Greg Noe (USGS), Jason Hubbart (VT – **W**), Jeni Keisman (USGS), Jeremy Testa (UMCES), Kenny Rose (UMCES), Kirk Havens (VIMS), Lara Fowler (PSU), Larry Sanford (UMCES – **W),** Leah Palm-Forster (U Del), Leon Tillman (USDA-NRCS), Leonard Shabman (Resources for the Future – **W**), Mark Monaco (NOAA), Mike Runge (USGS), Scott Knoche (Morgan State), Shirley Clark (PSU), Tess Thompson (VT – **W),** Tony Buda (USDA – **W**), Weixing Zhu (Binghamton – **W**).

Guests: Adrienne Kotula (CBC – W), Alex Gunnerson (CRC), Amy Goldfischer (CRC – W), Amy Handen (EPA – W), Amy Jacobs (TNC), Bo Williams (EPA – W), Breck Sullivan (USGS), Brian Benham (VT – W) Chris Guy (USFWS), Clinton Gill (DDA – W), Gary Shenk (USGS – W), Greg Barranco (EPA – W) Jennifer Starr (Alliance – W), Jeremy Hanson (CRC), John Clune (USGS – W), Joseph Prenger (USDA – W) Joseph Prenger (USDA – W), Judy Denver (USGS), Julie Reichert-Nguyen (NOAA – W), Karl Blankenship (Bay Journal – W), Katlyn Fuentes (CRC – W), Ken Staver (UMD – W), Kristina Saunders (UMCES – W) Kurt Stephenson (VT – W), Lew Linker (EPA – W), Marjorie Zeff (AECOM –W), Ola-Imani Davis (Alliance – W), Olivia Devereux (Devereux Consulting– W), Pam Mason (VIMS), Patrick Thompson (EnergyWorks – W), Rachel Felver (Alliance – W) Shannon Sprague (NOAA), Todd Lutte (US EPA), Tom Ihde (Morgan State – W), Kandis Boyd (EPA).

Administration: Denice Wardrop (CRC – **W**), Meg Cole (CRC), Melissa Fagan (CRC)

Call to Order, Introduction and Updates on STAC Activities — *Kathy Boomer (STAC Chair – FFAR)*
Kathy Boomer (FFAR) called the meeting to order at 9:00 am. At the start of the Quarterly, Boomer outlined the targeted outcomes for the two days, including discussion of an updated STAC workshop report approval process, approval of a FY20 workshop report and STAC 2022 Letter to the Executive Council (EC), and draft suggestions for the Chesapeake Bay Program (CBP) Wetlands Action Plan. The 2021-2022 Wetlands Logic and Action Plan is linked here. STAC Business was considered at the end of the first day.

Introduction, Chesapeake Bay Program Director — *Kandis Boyd (EPA)*
The new Director of EPA's Chesapeake Bay Program (CBP), Dr. Kandis Boyd, met with STAC to introduce herself in this role and share her vision for the Bay Program. Boyd has nearly 30 years of experience leading, teaching, advising and mentoring students and early career enthusiasts in environmental and atmospheric science. A scientist by trade, Boyd started at the National Center for Atmospheric Research (NCAR), where she developed research analyses for the Tropical Ocean-Global Atmosphere Coupled Ocean-Atmosphere Response Experiment (TOGA COARE). Boyd created the Turn Around Don't Drown (TADD) program, a public awareness campaign to help people understand the dangers of driving on flooded roadways. From here, she worked at NOAA in the National Environmental Satellite, Data, and Information Service (NESDIS) division and later, served as the deputy director of the Office of Weather

and Air Quality (NOAA) as well as the acting director for the Weather Program Office (NOAA). She functioned as the deputy division director at the National Science Foundation overseeing 35 individuals and a $5 billion annual budget to promote the progress of science and before joining CBP, Boyd served as the Strategic Advisor for the National Science Foundation's (NSF) Office of Equity and Civil Rights. "To take the technical and make it non-technical" is her career goal.

Visions and priorities for the CBP shared by Boyd were the following: greater science communication to inform policymakers and communities to make the best decisions possible; expand restoration efforts with additional data and analysis efforts; and promote a partnership of collective voices to redirect and realign priorities moving forward. Boyd provided an update on the most recent Principals Staff Committee meetings (July, August 2022) discussion items, including the Watershed Agreement and Bay TMDL in 2025 and beyond, changes to CAST 19-21, Conowingo WIP financing and nutrient assignments, wetlands and forest buffers, and implementing monitoring and analysis recommendations. The Bay Program met with each of the jurisdictions for a listening session to hear concerns on CAST 21 and groups were unanimous in their caution in moving forward with the current models. Boyd highlighted three takeaways from these discussions: address unaccounted additional loads post 2025; accurately monitor input fertilizer data into the current model and develop a process to deal with data abnormalities.

During the Question & Answer period, Kirk Havens (VIMS) asked whether there was any discussion of accessibility and equity with the tribal nations in the Chesapeake Bay and post 2025; Boyd responded that EPA Region 3 is engaging with at least 7 indigenous tribes and constructing listening sessions. Bill Dennison (UMCES) wondered when it would be appropriate to establish another set of goals within the Watershed Agreement, Boyd said that "yesterday" was the right time to recalibrate the agreement and the conversation has started on funneling efforts and prioritizing.

Comprehensive Evaluation of System Response (CESR) Update — *Denice Wardrop (CRC)*
Denice Wardrop (CRC) and Kurt Stephenson (VT), both leading the STAC effort entitled, Comprehensive Evaluation of System Response (CESR), presented an update on the report, with a review of content in sections 3-5, a preview of high-level implications, and a briefing on the review process and next steps.

Wardrop described Sections 3, 4, and 5, which address the potential characterization of response gaps (defined as the gap between the expected response and the actualized one to date) between the following: 1) management actions and stressor reductions in the watershed; 2) stressor reductions and the attainment of water quality criteria in the estuary; and 3) attainment of water quality criteria and Living Resources. In each section, the primary understanding of the uncertainties and/or basis for any identified response gaps are also discussed. Section 6 will speak to opportunities to increase the effectiveness of management actions and was presented in high-level form as it was still in process. In the near future, STAC will begin working with Rachel Felver (Alliance) to develop an appropriate communication strategy for the document. The presentation offered a look into the primary foundational sections of the report and gave STAC membership an opportunity to ask questions and flag issues of concern.

After the presentation, Ellen Gilinsky (Gilinsky LLC) began the discussion portion by proposing to include conclusions and next steps in the summary as most managers will not read the entire report and to begin the summary with positive findings. Wardrop agreed. Since the last time the CESR report progress was presented to STAC, Larry Sanford (UMCES) praised its progress including distinct changes in emphasis to the estuary and living resources sections. Sanford requested that the entire STAC membership review Version 2 of the report before making a final decision on whether to include yourself on the report or opt out. Wardrop and Stephenson were supportive and Wardrop stated she

was strongly in favor of a unified report from one voice, and willing to entertain changes that would allow for a consensus document. Sanford asked where the portion on oysters and subaquatic vegetation (SAV) fit; Kenny Rose (UMCES), lead organizer on Living Resources, responded that oysters were in the resource document and that in Section 5, there is an outline plan for the CBP to assess living resource responses to water quality and other restoration actions, including oysters.

Though the discussion has surrounded progress on content, Boomer did not think there was enough attention paid to the "red flag concerns" mentioned in previous meetings. She requested an opportunity to hear back on those comments with details on how they will be addressed. Wardrop said that the document does not need to be finalized for the CESR presentation on science and policy implications at the November Chesapeake Bay Commission meeting, but the primary messaging would need approval by then. Most if not all red flag comments received were addressed either via email or in a phone conversation with Kurt and/or Denice. In the next version, the approaches to satisfying these comments will be addressed. Boomer disagreed and stated her concerns were not yet captured and paraphrased a point brought to her by two other STAC members: the report focuses on status and trends, and BMPs, and therefor is not holistic in its assessment such as uncertainty about place, location, input data, etc. Chris Brosch (DDE) said he did not see evidence today that the report changed based on the red flag review.

On communications and outreach, Dennison emphasized the need to focus on the Executive Summary as that is the section most will read. The content is comprehensive and graphs well researched, but as stated by Dennison, not ready for public consumption and STAC should work on clarifying the story. Dennison offered to take charge of the Executive Summary document, in pulling together the most meaningful and impactful key findings and implications to highlight and feature them for the audience. Wardrop accepted the offer and mentioned the intent of Section 6 is to emphasize exactly that. Andy Miller (UMBC) emphasized the importance of messaging and crafting an “elevator speech” for the effort. Referring to an earlier point, Miller disagreed and thought the report spoke to and examined multiple factors in the system. Amplifying a comment in the chat written by Kristin Saunders (UMCES), Lara Fowler (PSU) strongly suggested moving forward and not wasting time in months of additional discussion. Havens reiterated Dennison's prior comments and recommended placing what has been accomplished at the beginning of the summary and specify what has been learned through this innovative process.

ACTION: **Bill Dennison** and others at UMCES will work with the CESR Writers’ Group and steering committee to begin crafting the Executive Summary document by highlighting meaningful and impactful key findings and implications for the broader audience.

STAC Workshop Approval Process — *Mike Runge (USGS)*

Over concern that STAC has lost oversight of STAC workshop report documents, Mike Runge (USGS) presented a revised review process on behalf of the Executive Board. Engagement with STAC after the workshop can be haphazard and the review process does not align with the review requirement of several constituent agencies. Speaking for himself, Runge stated that he feels personally disconnected from the process after the workshop request for approval (RFP) is approved. In addition, various affiliated agencies (i.e. USGS) require a review process that are not satisfied through the current STAC report review process. Runge proposed harmonizing the STAC review process with those of the committee's constituent agencies to meet affiliated agency needs more easily. The timeline for enacting these proposed changes is 6-9 months.

The suggested process includes a formal peer review overseen by an uninvolved STAC member in the role of Associate Editor (AE). STAC Executive Secretary would assume the role of Editor-in-Chief and in this context, STAC would be the publisher and Editorial Board. The reviewers may be STAC members or appointed by STAC if there isn't anyone with the necessary expertise. The workshop steering committee respond to the reviews and revise the report accordingly. At this point, reports with federal authors would go through the relevant additional review. The AE would work with authors to address the federal and peer reviews until all comments are addressed. One or two steering committee members would then present to STAC to complete this process, including a report out on workshop findings and a summary of review comments and responses, after which STAC would vote to approve the report.

Suggested next steps in revising the report process is to convene a small committee of STAC member volunteers who would draft a revised review protocol to later be reviewed by STAC. The volunteer committee would revise the draft workshop report protocol based on received comments and bring the updated protocol to a STAC meeting for final approval. In the meantime, this process would be implemented on a trial basis. Dennison requested that if the review process is not anonymous, the reviewers name be included on the STAC report and to cap the review process so that it is completed within a reasonable timeframe. STAC Liaison, Gary Shenk (USGS), underscored that a STAC workshop report is a report of what was discussed at the workshop; external reviewers would not be able to comment on the report having not been at the event. Although the reviewers would be assessing the science, the science communicated in the resulting report would have been arrived at by participant consensus. In response, Jeni Keisman (USGS) stated there may be a middle ground and reviewers could evaluate whether the content supports the conclusion/recommendations. If the group decides not to incorporate this level of domain expertise review, Keisman said that STAC can consider if the workshop was well-described and represented. Miller agreed but underscored that the steering committee is under strict guidelines to only represent a record of what had happened at the workshop (ie presentation content, discussion points). If the group does decide to include an expert review, Miller advised they be someone with enough connection to the workshop to understand the context. Thinking about the audience, Leah Palm-Forster (U Del) added the need to engage people who are not often in the peer review process and consider how to motivate those individuals to take part in and contribute is important – drafting workshop guidelines would help in this regard.

ACTION: STAC members should consider opportunities for their organizations or universities to partner with a staffer to address a science need. The CBP Science Needs Database hosts all current Bay Program science needs.

Briefing on FY21 STAC workshop, "*Assessing the Water Quality, Habitat, and Social Benefits of Green Riprap*" – *Kirk Havens (VIMS)*

Havens presented on behalf of the FY20 STAC workshop entitled, "Assessing the Water Quality, Habitat, and Social Benefits of Green Riprap". The workshop webpage with additional materials such as presentations from the event is available here. This STAC activity sought to synthesize the state-of-the-science on green techniques for riprap revetments and identify research needs. Green Riprap is a low cost, simple restoration technique used to improve the water quality, habitat, and aesthetics of shorelines hardened with rock revetments. Green Riprap involves planting marsh vegetation in the voids between riprap rocks. Green Riprap provides another tool for waterfront homeowners and river groups to improve water quality in the Bay or river while creating a more natural look along their shoreline. Havens emphasized that Green Riprap is not a substitute for or a type of living shoreline. Rather, Green Riprap is an enhancement of a structural shoreline solution and should be limited to areas that are already hardened or where Living Shorelines are not practicable. In addition, planting marsh grass into a riprap structure is not considered a form of tidal marsh compensation.

The workshop brought together scientists, practitioners, and NGOs to share aspects of shoreline systems that Green Riprap could contribute to and elucidate the best practices for their construction. The workshop was a single-day online meeting with an optional field trip to example Green Riprap projects. The workshop convened experts from multiple disciplines to evaluate the state of the science for Green Riprap, including estuarine scientists that study tidal wetlands and tidal shorelines, shoreline engineers, physical modelers, and social scientists. Several Green Riprap projects built by the U.S. Fish and Wildlife Service and other groups were shared through talks, a virtual field trip, and an in-person field trip. The virtual field trip was completed in order to provide all participants with a field experience and featured steering committee members, practitioners maintaining the Green Riprap sites and residents living near the installations. The video can be accessed here.

Havens began the initial trial run of the STAC report review process by reporting out on comments received during the participant and STAC member reviews of the workshop report. Feedback was supportive of the report (e.g. "well laid out", "appropriate style for the type of information this workshop generated") and praised the adaptive use of workshop funds for a virtual site visit as this creates a video legacy of the workshop product. Dennison wondered if the virtual video could be utilized to communicate other STAC-funded workshop activities and Mark Monaco (NOAA) inquired about whether property values increased due to residential Green Riprap projects. Havens agreed that a visual representation of most STAC events can be beneficial and to Monaco's point, the steering committee did invite realtor associations but none were in attendance; though, Havens mentioned that in Virginia, there is a tax incentive program associated with installing/retrofitting a revetment or shoreline with plant species. Following up, Boomer asked whether Havens saw the outcomes or potential for this report to include policy implications; Havens did not believe there were any permit requirements to Green Riprap as it is building upon existing stone structures. Pam Mason (VIMS) clarified that in Virginia, the current version of the living shoreline law states that living shoreline should be implemented everywhere suitable unless can be demonstrated as not suitable. In this case, enhancements (such as Green Riprap) should be used to make it less adversely impacted.

Building Capacity in the Strategic Science and Research Framework through the Environmental Management Career Development Program

— Alex Gunnerson (Environmental Management Staffer with STAR, CRC)

The Environmental Management Staffer with STAR, Alex Gunnerson (CRC), presented an overview of the Environmental Management Career Development Program (EMCDP) and staffer role, how staffers help manage the process of Strategic Science and Research Framework (SSRF) and the ways in which they help address science needs through action and development. The purpose of the EMCDP is to support those right out of college or grad school, or early on in their career and individuals with higher education goals to network and meet mentors, find scholarships, and find their research project; in general, the program can support staffers in understanding what they want to pursue. Three major staffer responsibilities are coordination, professional development, and independent research-type projects.

As a resource for SSRF, Staffers play a critical role in their workgroup's progression SSRF and SRS by coordinating the various steps of the of the process to keep their outcome on track, taking notes and organizing science needs, and collecting information pertinent to the science needs database. In supporting the functioning of SSRF, staffers create the presentations, input the science needs and organize them within the database, increase awareness of and to relevant science needs, and identify science needs to the interests of CBP partners that can provide resources (i.e., identify GIS projects for a university's master's program).

Gunnerson reviewed the SSRF and SRS process, stating that they are two different processes, but complementary. The SSRF provides a strategic approach to gather, track, and maintain science needs for the different outcomes under the Watershed Agreement, focus existing resources to address the science needs, and effectively provide science to advance CBP's efforts and decision-making. The science needs should be connected to SRS decisions and may build on content in SRS materials. There are built-in touch points for the SSRF process, to make sure there is time to structure and discuss these needs such as the STAR Science Needs Meeting after the cohort presents to Management Board.

The Staffer program also provides opportunities to build and utilize skill sets for their future vision of either continued education or the next professional position by taking on science needs as projects. Staffers can also incorporate science needs into independent research projects to ensure their research is relevant to key knowledge gaps. Through this work, staffers can develop their skill sets in an applied setting that increases CBP capacity to address science needs required to meet the CBP goals and outcomes. Science Need based projects help Staffers receive valuable professional and research experience which sets them up for future studies or jobs. This strengthens the scientific leadership pipeline for the long-term restoration of the Chesapeake Bay Watershed by training future environmental managers and scientists in the region. STAC members were requested to consider if their organization or university could partner with a staffer to address a science need.

Boomer mentioned that at the Chesapeake Community Modeling Program (CCMP) this past summer, the was a discussion on setting up an informal lunch webinar with Chesapeake Research Consortium Staffers and STAC members as an opportunity for Staffers to explore career opportunities/paths. This could be a platform to provide feedback to researchers throughout the community about the Bay Program and research/information needs. Shenk followed up that it is not unheard of for STAC members to poach Staffers as PhD students for the benefit of the Bay Program.

Science Needs of the Chesapeake Bay Program: Next Generation Stewards
— Breck Sullivan (USGS), Shannon Sprague (NOAA)
Breck Sullivan (USGS) started the discussion on science needs with a brief reminder of the Strategic Science and Research Framework (SSRF) and its approach to: 1) gather, track, and maintain science needs for each outcome; 2) focus existing resources to help address the science needs; 3) identify priorities for new resources; and 4) expand CBP science capacity through more partnerships. There are ten identified CBP goals that work together to achieve the Bay Agreement through specific, time-bound, measurable targets (or outcomes). Meeting the overall goals requires a vast amount of science and the SSRF process was developed to help increase the amount of science available to the Bay Program.

The Next Generation Stewards Cohort presented their science, financial, and policy needs, lessons learned, and progress towards their outcomes to the Management Board (MB) in May 2022. In June, the Cohort met with STAR to discuss specifically their updated science needs and at the STAC September 2022 quarterly, met with the Committee to gather technical feedback intent on making the science needs most actionable by considering already existing resources to meet the science needs and connection points across identified outcomes. STAC members are requested to submit feedback on the Next Generation Stewards Cohort via email after the quarterly to help expand the science capacity of the Chesapeake Bay Program. Sullivan provided recent successful examples of external support that has fulfilled identified science needs through the **Chesapeake U** program, which connects CRC member institution faculty, students, and staff with STAR/GITs to address science and communication needs through an engaged, collaborative effort. Old Dominion University (ODU) and Penn State have helped build capacity for the Bay Program through mentored internships and master's project internships and aligned science needs course curriculum. An August 2020 presentation given by Denice Wardrop (CRC) to STAR on Chesapeake U is available for review here.

ACTION: STAC members should consider opportunities for their organizations or universities to partner with a staffer to address a science need. The CBP Science Needs Database hosts all current Bay Program science needs.

ACTION: STAC members are requested to submit feedback on the Next Generation Cohort. You may either email STAC Staff or Breck Sullivan directly (bsullivan@chesapeakebay.net) with your comments and suggestions on the following questions:

- Do you or any of your colleagues have interest in contributing to addressing one of these needs?
- Do you or any of your colleagues know of existing efforts to support one of these needs?
- Do you want more information to come back to STAC from any groups on specific needs/projects?
- Are these needs appropriate? Do you see something missing?

Links: CBP Science Needs Database

Shannon Sprague (NOAA) presented on the Next Generation Stewards' goals including environmental literacy planning and student outcomes. The goal of **environmental literacy planning** requests each participating Bay Jurisdiction develop a comprehensive and systemic approach to environmental literacy in the region that includes policies, practices, and voluntary metrics that support the Bay Agreement Goals and Outcomes. This can be in the form of answering the Environmental Literacy Indicator Tool (ELIT) survey. The highest priority identified science need is a better articulation of the green career/workforce pathway to support a diverse pool of environmental candidates and to assist the Workforce Action Team. In response to a question from Andy Miller (UMBC), Sprague stated that the Cohort needs to understand where the programs are occurring and figure out gaps and then begin to fill in those identified gaps. Lara Fowler (PSU) mentioned a sustainability portal similar to Josh's Water Jobs could be an effective tool to leverage workforce and paid internship opportunities focusing on the Bay; Boomer agreed and noted that working with a researcher to create grant opportunities for master's and PhD students could build on the workforce development mentioned earlier.

The second cohort goal is to continually increase **student outcomes** age-appropriate understanding of the watershed through participation in teacher-supported, meaningful watershed educational experiences and rigorous, inquiry-based instruction, with a target of at least one meaningful watershed educational experience in elementary, middle and high school depending on available resources. Determining evidence-based criteria to highlight how MWEEs are advancing K-12 student outcomes is a high priority science need as state departments of education are increasingly relying on evidence-based practices to support decision making. There are partial resources to reach this goal: NAAEE's benefits of EE for K-12 students literature review; NOAA B-WET MWEE research list; and NOAA B-WET evaluator. Sprague mentioned the overarching need to align existing data with school district science needs, and to build out tools and outreach from there. The cohort currently has a request to the CBP to assist these science needs by providing the sample survey we have prepared and/or hiring a contractor to interview district representatives.

Conowingo Discussion

— Kathy Boomer (FFAR), Larry Sanford (UMCES), Andy Miller (UMBC), Karl Blankenship (Bay Journal), Jeremy Testa (UMCES)

STAC members and Karl Blankenship (Bay Journal) lead the conversation on examining impacts of the Conowingo reservoir system on sediment, nutrients, and fate and transport delivery to the Bay. This panel was part of an ongoing discussion series on capturing the state of understanding at Conowingo that culminated with this session. Jeremy Testa (UMCES) and Blankenship are currently working on an n

article about the public perception at Conowingo, Blankenship presented on communicating the scientific and policy controversy surrounding the dam. Boomer acknowledged that even within STAC, there are different ideas about the potential impact and role of Conowingo. Blankenship was open to input on the in-progress Bay Journal article and Boomer offered to help with the piece.

Thinking on earlier STAC meeting talks, Testa considered science communication as a difficult but crucial task as is exploring what is not understood. Andy agreed and stated that this was clear when writing the letter of public comment and investigating trends Testa said, as there seemed to be a phosphate increase within the reservoir itself and there was not a clear explanation for it. One of the paths forward with the Bay Journal article could be to inform the unknowns in the system. The letter of public comment was the first in the last several years, suggesting there should be funding invested from the Exelon agreement into field studies to better understand the biogeochemistry of sediment, water exchange, and/or nutrients in the system. Sanford worked with Testa on reports on the remobilization of material and noted that UMCES focused not only on what happens behind the dam, but what occurs in the Bay itself. A key takeaway to understand is that the visibility to the public is far worse than the actual impact partly due to the nature of the plumes caused by the circulation of the Bay; Sanford questioned whether it would be possible to correct this miscommunication with the public.

Dennison commented that the presented satellite picture of Conowingo clearly shows the tributaries are not effective and Conowingo is not to blame. Connecting points, Boomer mentioned this can be an opportunity to support this concern as CESR advocates for more focus in the local shallow waters. Referring to Dennison earlier about communicating the message, Leon Tillman (USDA-NRCS) suggested a video like the FY21 Green Riprap workshop virtual fieldtrip to communicate the message in an effective, easy way without spreading additional misinformation; Havens agreed. Miller added that speaking with CBP groups directly can dispel much of inaccuracies. In February 2022, Miller spoke with the Citizen Advisory Committee (CAC) on this topic.

STAC Business, Announcements — *Kathy Boomer (FFAR)*
Boomer requested the approval of the consent agenda, which included the nomination of new Executive Board members, Letavic and Palm-Forster, changes to the BMP Expert Panel Protocol, and approval of the 2023 quarterly meeting dates: March 15-15, June 13-14, September 12-13, and December 5-6. Havens motioned to approve the consent agenda and Fowler seconded. The consent agenda was approved. Next, Boomer requested a motion to approve the June 2022 quarterly meeting Minutes. Havens moved to approve the June meeting Minutes and Miller seconded the approval. The June meeting Minutes were approved. Finally, Boomer requested an approval of the June – August Executive Board (EB) meeting Minutes from an Executive Board member. Gilinsky motioned to approve and the Minutes were passed without exception. Presentation slides from June are available on the meeting webpage.

Boomer invited STAC members to share any relevant announcements. Fowler invited STAC members to attend an in-depth workshop hosted by Penn State from December 12-14 in Lancaster, PA about how to address both agriculture and water quality in Pennsylvania, with a particular focus on the PA portion of the Chesapeake Bay. If anyone is interested in participating, the details are online. Day 1 is a reporting back on efforts since we first hosted this kind of discussion in 2016, and days 2-3 are in depth discussions on how to accelerate action on the ground (funding, technical assistance, and more). This is not an academic conference, but a "roll up our sleeves and help propel action" set of discussions.

- **CAST-21 Fertilizer Data Discussion —** *Kathy Boomer (FFAR)*
  CAST Consensus Items from the September 2022 Principals Staff Committee Meeting
  — *Olivia Devereux (Devereux Consulting)*

Chesapeake Bay Program Office (CBPO) staff alerted states that some agricultural fertilizer sales data had been erroneous in CAST-19 and was corrected in the review version of CAST21 prior to the review. Other missing and new data was identified for CAST-21 during the review period, namely 1) one year of broiler populations, and 2) four years of crop yield data for six major crop types. The CBPO held one-on-one meetings with all jurisdictions and addressed the omissions in Bay Program forums and new procedures are in place to prevent these errors in the future. Jurisdictions are expected to account for these additional loads by either 1) amending the Phase III WIPs, or 2) updating the 2022/2023 or 2024/2025 milestones.

For those STAC members not in the conversation or only recently cycling onto the committee, Boomer provided a brief overview on CAST and how it is used after reporting out on the errors and omissions found in CAST-21 data. Fowler asked Shenk, who works on Chesapeake Bay Program Watershed Model Development, the reason behind the missing data – Shenk stated that while gathering the data from all the states, Virginia was left out resulting in about 20% less fertilizer in CAST-19 than is accurate. Dennison noted that if the program were to wait until 2025 to rectify this issue, adaptive management isn't operational as it is about adjusting as issues arise. Miller countered that STAC did speak with the program and took a position, with Sanford representing STAC at the meeting. STAC did not agree with omitting the data even if it is flawed; Boomer followed that there is not a debate on incorporating the data, but there is a conversation on the path forward for refining the data and the possible role STAC could play in this roll out. Rose asked Shenk how the program will prevent a future data misstep as trust in the CBPWM can be easily lost. Protocols are now in place that when the model is updated, it will be sent to all partners before it is released. Additional internal processes are also being strengthened, including a PSC consensus.

Wardrop asked for clarity on the “short-term resolutions” to get CAST up and running again and Shenk elaborated that within a 6–8-month timeframe, an informal group will gather around fertilizer data and methods of collecting that data; the Water Quality Goal Implementation Team (WQGIT) and MB will kick off this process. The Ag Modeling Subcommittee is not involved as it is inactive after completing Phase 6 work and although the Ag Modeling Team has been generated to take its place, this group has not started meeting. Gilinsky wondered what data the accurate data for fertilizers is, as this question comes up yearly at the jurisdictional level, and whether there is a role for STAC in that determining where there may be better data. Brosch was a member of the original Ag modeling subcommittee and stated that the data used is purchased by the Bay Program and is the only dataset available for the period needed, only set uniformly across the counties and at the correct scale and has the vetting of the state chemists. This among other reasons is why the decision was made to aggregate the data to the Bay scale before redistributing it down to the counties.

- **Discussion of STAC 2022 Letter to the Executive Council —** *Kathy Boomer (FFAR)*

To close out the first day, Boomer presented STAC with the drafted STAC 2022 Executive Council Letter as written by the STAC Executive Board. The letter is due by the end of September and introduced at the October Executive Council meeting in Annapolis – meeting webpage here. The draft letter highlights adaptive management and ways the program can move to the next level of adaptive management. As usual, STAC workshops and their findings will be addressed and possible recommendations resulting from STAC activities. Other recommendations suggested are on supporting the Bay program's Wetland Action Plan, strengthening commitment to recruiting diverse perspectives among stakeholders and communities, recognizing the value and importance of soil health, and continuing to refine the bay program's priorities with national priorities.

From Havens previous experience as STAC Chair, we want to provide the governors and staff with an ask they are willing and prepared to champion. For this round, adaptive management is beneficial to include

in order to prepare them for the depth of management change and CESR. On the $25million Maryland is spending on plans for Conowingo, Runge heard there may be performance-based standards associated which is a massive governance shift from relying on BMPs - shows a willingness to adapt. Wardrop was struck by the same detail as it is in the implications section of CESR. Though she is supportive of the single, double, triple loop learning concept, Wardrop advised against introducing it in the letter as it may create an unnecessary sticking point with EC members who are unfamiliar with such language when it is more important they focus on the recommendations. Miller and Rose agreed. On letter flow, Palm-Forster suggested mentioning CESR at the start, recommendations in the middle, and adaptive management at the end. What would adaptive management look like? Somehow emphasize of knowledge being developed through CESR to better inform discussions; to be specific, Runge suggested speaking on necessary changes post-2025 such as 1) increasing our scientific understanding and how that leads to decision-making, 2) reevaluation of the TMDL and other goals tied to living resources, and 3) adaptation throughout the CBP governance structure.

Boomer floated including a section on the soil health concept explored at the STAC June quarterly meeting. Stating the exact reason why soil health is concern (ie crop production) will land better with the EC than the terminology of soil - Havens. The EC may not be educated on soil health and describing it briefly or speak to a specific aspect of soil health we are targeting would be clearer, Keisman added; Tillman proposed pulling in climate resilience or another use that can contextualize soil health for the EC. Fowler cautioned against speaking only to the biophysical nature of these issues but pull in the human health aspect to create connections. Wardrop thought there could be a space to discuss this under CESR as the report points to many social science and behavioral issues that need to be addressed.

DECISION: The consent agenda, June meeting Minutes, and the July – September Executive Board Minutes from the past quarter are approved.

DECISION: The STAC 2022 Executive Council Letter will avoid using single, double, triple loop learning language but will underscore the importance of adaptive management post-2025 to . Attention should be paid to the flow of the letter, beginning with larger initiatives (CESR, adaptive management), workshop highlights, and closing with recommendations.

Wednesday, September 14th:

Introduction to Meeting Theme: Advancing the CBP Wetlands Target — *Kathy Boomer (FFAR)*
Boomer began Day 2 with an overview of the meeting theme and a discussion of advancing the CBP wetlands target. In early August, the CBP led by the Habitat and Water Quality GITs, held a 2022 Restoring Wetland of the Chesapeake Bay Watershed Workshop focused on the lack of collective progress toward our wetland restoration targets to ameliorate water quality concerns, workshop webpage available here. The GIT leads convened the community workshop to initiate the development of an Action Plan to address the shortfall. The Action Plan was presented with a request for support from the CBP Management Board at their November meeting. To support this effort, the September STAC meeting focused on strategies to bring the best available science forward to maximize the likelihood of the Action Plan's success. The objective of these conversations was to develop a unified statement of support regarding this critical initiative which could provide multiple benefits (ecosystem services) central to the CBP's restoration goals and to highlight opportunities for beyond 2025.

Wetland Workgroup Chair, Mason, presented on the Wetland's goal progress. The CBP Wetlands Outcome to create or establish 85,000 acres of tidal and non-tidal wetlands and 150,000 acres enhanced by 2025. Overall, there is unaccounted for wetlands loss due to agriculture, forestry, and tidal marsh. An evaluation of the Watershed Implementation Plan (WIPs) wetland commitments by jurisdiction shows

that even if commitments were achieved, the outcome still would not have been attained. Based on the WIPs: 41,350 acres still need to be created/restored and 110,180 acres still need to be enhanced. Historic tidal wetlands loss is largely due to development thought current and future tidal wetlands losses can be attributed to sea level rise; the VA Coastal Resilience Master Plan projects 86% loss by 2080. As of now, there is limited government funding with small projects are mostly focused on living shorelines and priority actions mostly taken on non-tidal wetlands. There is a need moving forward for more significant and equitable funding for tidal marshes, greater governance leadership and collaboration, and more capacity. Erin Letavic (Herbert, Rowland & Grubic, Inc.) asked for more clarification on concentrating in the tidal marshlands as opposed to nature-based solutions, Mason responded that she is focusing on one element instead of the entire goal of the CBP.

***Panel*: The History of Science-based Wetlands Management in the Bay Watershed**
— Judy Denver (USGS), Greg Noe (USGS), Kirk Havens (VIMS), Solange Filoso (UMCES), Denice Wardrop (CRC)
The first panel focused on the history of science-based wetlands management in the Bay watershed. Invited panelists were knowledgeable in wetland function and how this varies across space and time in a management context. Most speakers have been involved in CBP Wetland Expert Panels, so they have insight and experience with translating the science into a policy framework. Starting off the panel with insights from this morning, Greg Noe (USGS) noted much of the wetlands loss is social, cultural, and policy, though on the science-side, researchers have been working to deduce landscape setting influence from bio and physical and human drivers of wetland functions, so that there is a better understanding on the ways in which hydrologic connectivity and connectivity to load sources can influence wetland functions. Noe noted there is room for improvement on the underlying model assumptions on crediting. By advancing monitoring, prediction, and incorporation of multiple ecosystem services beyond nitrogen, phosphorus sediment, load reductions, in addition to an incentivization system, there may be more wetland restoration and creation. Solange Filoso (UMCES) agreed with Noe and suggested to start thinking on a watershed perspective as wetlands can help restore the hydrology of a watershed. Filoso was recently part of project funded by the Army Corps of Engineers to aid in decision-making for determining where to restore based on flood control.

Wardrop followed up on statements from the group to underscore how difficult it is to design wetlands for a specific function. There should be a natural distribution of wetlands of various types in specific places to result in a watershed level of function. Designing wetlands is impactful but there are trade-offs when maximizing nutrient retention capability, the habitat is reduced. It is important to understand the whole suite of services and not only chase water quality and available data/tools can help us better understand wetlands of various types on the landscape. Wardrop advocated to design based on forecasted conditions as the pronounced seasonal consequences we are used to managing under are a 20% of what is expected under future climate scenarios. Filoso agreed and added the surrounding environment is relevant to the wetland function as well. Judy Denver (USGS) agreed with all panelists and stressed the need to put it all under a social, political, cultural perspective to aid in the understanding of wetland importance and benefits. Knowing whether the area is mostly service water driven, it can help the user properly understand the function. In addition, with more funding, Denver encouraged more regional testing of stream quality and plant communities to better frame hydrogeologic conditions. Lastly, Havens spoke on which factors may impede the achievement of the CBP Wetlands Outcome and moreover, is it the number of acres restored or the ecological services associate with those enpoints? The Wetlands Target could be rephrased based on the desired outcomes such as additional habitat, biodiversity, water quality aspects, flood retention, etc. STAC could assist in pulling in advanced technologies now available to track remotely and maximize co-benefits associated with ecological services.

Tillman asked the group about potential avenues to scale up wetland projects and Wardrop emphasized the need to focus on implications and consequences or if not done properly, this could cause many ecosystem services to geographically transfer where they are not truly needed. Noe followed up in agreement and though expensive, rewetting the riparian landscape, a large, connected network of riparian wetlands can help create hydrologic storage on the landscape. Wardrop mentioned beavers. Filoso advised to consider the baseline for water retention and capacity that has since been lost in a watershed. What would you gain with better water quality and some of these functions back? Havens argued again STAC could be used to prioritize or target where you may receive the most co-benefits or another goal aside from an acreage number. Boomer advocated that as well as creation, the Bay Program goals should value wetland conservation as natural, high-functioning wetlands in good condition are not valued for the water quality benefits they provide; Havens noted that under a permitting process, there is an acceptance that there will be losses where mitigation and compensation is not always successful.

On trade-offs and costs, Scott Knoche (Morgan State) questioned where costs are involved within restoration goals considering various attributes of wetland structure, function, service, etc. Amy Jacobs (The Nature Conservancy) admitted it is challenging due to first, rarely performing a full-cost accounting for a restoration project, second, needing to engage the landowners and provide feasible opportunities, and lastly, funding on the ground. Due to a strict timeline of implementing Federal program dollars on the ground and programmatic limitations that prevent covering the entire cost of restoration, Tillman said that that on the agency side, there is not often the funding to encourage a landowner to take on a project. On the other hand, Tillman spoke from his experience that sometimes regardless of the resources available, an individual producer will not participate in the action if they do not preserve it as having value. Tillman advocated for including Ag economists and sociologists in STAC conversations to speak on what will benefit or incentivize the individual. Ellen Kohl (St. Mary's College) built off this point – it is not enough to consider the benefits of marginalized groups in federal/environmental programs, but an active assessment beyond the science to examine the societal impact of the preservation of wetlands is required. Havens noted most green/natural infrastructure is pushed onto underserved communities without asking what the group truly needs.

On designing incentives to pull in homeowners, Miller questioned how to best design wetland programs. Possibly one solution could be to bundle wetland restoration into a green infrastructure package to accomplish multiple goals together, speaking to homeowners about a package instead of a riparian buffer goal or wetlands goal - Wardrop. A real issue is capacity and as STAC members, Noe recommended training the next generation to continue working towards these outcomes. Fowler noted the need to focus more on restoration effort and peer-to-peer engagement to move this forward, and less on paperwork.

Panel: Summary of Outcomes from the August 2-3 CBP Meeting
— Pam Mason (VIMS), Chris Guy (USFWS), Todd Lutte (US EPA), Amy Jacobs (TNC), Leon Tillman (USDA NRCS)
The second panel concentrated on a summary of outcomes from the 2022 Restoring Wetland of the Chesapeake Bay Watershed Workshop and how science is translated into policy. Chris Guy (USFWS), member of the Outcome Attainability Action Team (OAT), Read the OAT Update II to the CBP Management Board here. The main objective of the OAT is to review the progress/status of the 31 outcomes of the 2014 Agreement, identifying those that have quantifiable targets, and specifying alternatives for those outcomes that are unlikely to be met without a significant change of course. From the team's evaluation, the Wetlands Outcome is significantly off course. There is incomplete tracking information, and more data support and interventions are needed to increase rate of implementation. This assessment and the heavy lift carried by the Wetlands Outcome led to the August CBP Wetlands workshop. There is a diffuse network of voluntary wetland restoration, with the Natural Resources

Conservation Service (NRCS) the most involved but still broader than just wetlands. Resource and capacity are extremely limited and Bay Program leadership needs to prioritize wetlands to begin tracking wetlands and making progress towards the outcome. Before the end of the calendar year, a draft action plan based on the findings from the workshop should be drafted. Mason added that messaging for consumers and decision makers is paramount. Tillman in coordination with Guy facilitated the August workshop, and spoke of findings such as funding opportunities, identifying the need for additional technical resources and specialists, and evaluating resources within various jurisdictions that may be leveraged to make additional progress and investments in the future.

Jacobs shared insights from the workshop on accelerating Wetland Restoration in the Bay and ways in which STAC can contribute to the Wetlands Outcome. Through a workshop exercise, participants established priorities across Del Marva including figuring out how to engage with landowners and understanding their concerns through three partners on the ground (The Nature Conservancy, NRCS, and Ducks Unlimited). Findings showed that by providing information about this opportunity to restore wetlands, double the level of interest. From here, a survey was created to understand stakeholder interest and attitudes toward restoration. 370+ responses were received from over 70 priority areas. Primary motivations for restoration were wildlife and water quality and younger landowners were more receptive to these functions but also more concerned it would hurt their property value. Overall, 65% of landowners were never contacted about restoration on their lands and 77% of those were interested in learning more and having someone visit their property. With the tracking system in place, outreach specialists now can move forward and continue interacting with landowners to better understand barriers and obstacles. Determined ways STAC can advocate for this outcome is by underscoring the importance of targets and deliberately incorporated stakeholder concerns into those plans, integrating social science to increase engagement (providing the right tools/incentives/etc.), continuing to offer feedback to improve, and finally, integrate these pieces together to identify weaknesses in the system, and finally, evaluate projects on the ground regarding how they are functioning from the landscape perspective.

During the discussion period, Runge asked about capacity to reach production goals. Jacobs explained it is a challenge as engineering is in high demand, NRCS has capacity limits as well and is working on hiring field-level employees of staff engineers, agronomists, biologists. Mason proposed STAC highlight the services and benefits coming from the Wetlands Workgroup by partnering with the various districts while motivating EPA within the Bay Program to participate in their four ‘core values’ for wetlands. Kevin Du Bois (DoD, Chesapeake Bay Program Coordinator) recommended wetlands be framed more like a commodity and could be a space for STAC to frame this discussion a better. Testa asked why consulting companies are not tapped to do some of the extra work, Jacobs mentioned cost and NRCS approval as reasons up to this point, outside providers have not been contracted but they are considering this option. Jacobs also stated this is not the only barrier, aside from Del Marva, there is no other area across the watershed with a list of landowners interested in restoration. Based on Jacob's presentation, Palm-Forster suggested a recommendation from STAC could be that to make progress in answering the unknowns, hiring needs to happen on multiple levels; Mason agreed and requested STAC speak to the co-benefits of Wetlands in a concise way. Tess Thompson (VT) works in one of two departments that produce agricultural engineers in the area and described having difficulty in persuading younger people to work in agriculture unless they have had an internship; Boomer agreed and added that is a major concern heard from land grant universities.

Hearing policy recommendations, Miller repeated that STAC is not traditionally supposed to promote policy but can frame this as a discussion on barriers and/or impediments and the success of efforts, and suggested whatever is not covered in CESR already, could be considered for inclusion.

ACTION: STAC members are encouraged to provide input or add comment to the Wetlands Outcome Logic and Action Plan by reaching out to STAC Coordinator, Meg Cole (colem@chesapeake.org) or Pam Mason (VIMS) directly at mason@vims.edu.

Application of the Adaptive Management Framework — *Kathy Boomer (FFAR)*
The last agenda item of the workshop focused on how STAC may help advance the wetlands target. Guy suggested the next step, is to create a master list of funding sources exclusively for wetlands and individuals are encouraged to share the questionnaire with NGOs, contractors, federal employees, state and local employers. This list will review the capacity for each individual/group with information on expertise (design, grant, etc.), technical capabilities, funding options, etc. A final list that is still in the works is a collection of projects that groups would like to jump start but lacking funding or technical capacity, etc.

As a long-standing group of independent scientists, Jacobs suggested STAC be an advocate in the long game for thinking holistically about integrating social and biophysical science into the wetlands goal and to start the conversation on rethinking the goal. Guy argued that past 2025, the need is to define the loss of wetlands across the watershed, if they can realistically be restored, and projection of acreage under climate change. Tillman suggested questions including whether management actions were restoring the wetland, protecting the wetland, or enhancing the wetland. How are we restoring the wetland? Are we just protecting the wetland? Are we enhancing? How is enhancing a wetland defined? Wardrop saw parallels between the CESR effort and the wetlands discussion and recommended including wetland examples in the EC Letter to support STAC comments on reexamination of goals and targets. Although STAC is not a political committee, the group can reaffirm to the partnership the importance of wetlands. Wetlands have clear benefits, but the number is not always quantified. Often this means decision-makers don't pay attention - Shenk. A possible note that could make decision-makers listen Andy mentioned, wetlands can be a sink or a source if removed. This would be relevant to the overall mass balance; Tillman agreed but suggested the addition of another benefit in addition to metrics such as a species count. Sanford proposed a still outstanding science question: given the hydrologic context, what is the optimal scale of a restored wetland in different environments? Questions such as these are helpful to ask when limited by resources. Miller agreed and suggested stating it is not possible to have an accounting framework that does not recognize the same exact natural feature in different places on the landscape have different impacts – have to emphasize this.

Ending the meeting, Boomer proposed using language in the EC Letter on "creating a vision for green infrastructure", discussing the cumulative benefits of wetland system throughout the watershed and a framework for evaluating where we are and where we need to be to achieve multiple outcomes. Haven suggested using the term "nature infrastructure" instead. Mason and Guy pushed back and requested not to lose the term "wetland" in the EC Letter.

DECISION: Language in support of a reexamination of goals and targets using the wetlands outcome as an example will. be included in the STAC 2022 Letter to Executive Council.

The STAC December quarterly meeting will take place virtually on Tuesday and Wednesday, December 6th and 7th. The meeting theme is environmental flows.